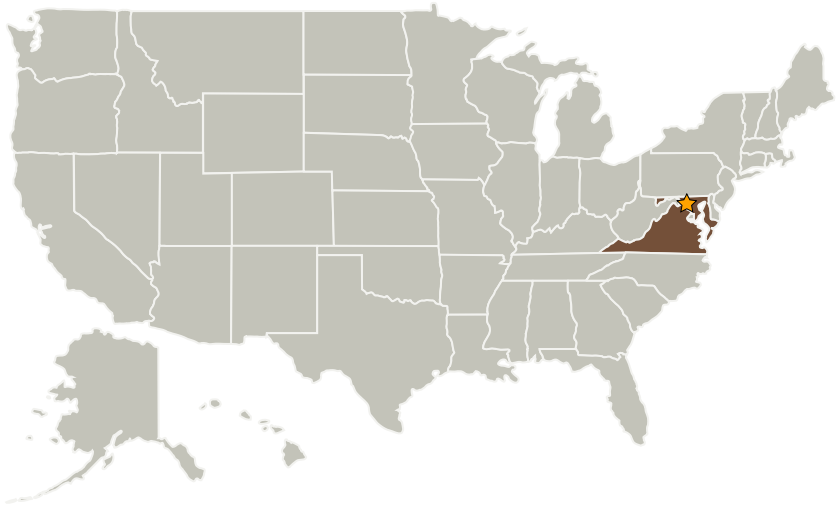
# An all MMIC Replacement for Gunn Diode Oscillators, Phase II

Completed Technology Project (2004 - 2006)

## Project Introduction

The objective of this Phase II project is to develop and demonstrate a compact and reliable oscillator technology for the frequency band from 100 ? 250 GHz for use in terahertz local oscillators and transmitters. The new oscillators rely on MMIC technology that is reliable and robust, offers the best overall performance and will be suitable for volume production and commercialization. These oscillators meet immediate needs for NASA's Earth Science program, specifically for terahertz radiometers for studies of the atmosphere and climate change. The oscillators are also useful for a wide range of other scientific, military and emerging commercial applications. The Phase I study demonstrated the feasibility of the new oscillators through the development and demonstration of an oscillator at 146 GHz suitable as a driver for an 874 GHz cloud ice radiometer being developed at NASA/GSFC. This new component greatly exceeds the performance of any other commercially available oscillator technology while maintaining a compact size, power efficiency and all solid-state construction. The Phase II research is focused on achieving greater power for higher frequency terahertz sources, improving power efficiency, achieving more compact integration of the subcomponents and extending the basic design concept throughout the 100 ? 250 GHz band.

## Primary U.S. Work Locations and Key Partners

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## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Goddard Space Flight Center (GSFC)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

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| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| ★Goddard Space Flight Center(GSFC) | Lead Organization | NASA Center | Greenbelt, Maryland |
| Virginia Diodes, Inc. | Supporting Organization | Industry | Charlottesville, Virginia |

| Primary U.S. Work Locations | |
|---|---|
| Maryland | Virginia |

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

## Technology Areas

**Primary:**

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.4 Microwave, Millimeter-, and Submillimeter-Waves